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exists to-day), who is prejudiced against Darwinian views, go to the forests of Borneo. Let him there watch from day to day this strangely human form in all its various phases of existence. Let him see it climb, walk, build its nest, eat and drink, and fight like human 'roughs.' Let him see the female suckle her young and carry it astride her hip precisely as do the Coolie women of Hindoostan. Let him witness their human-like emotions of affection, satisfaction, pain and childish rage—let him see all this and then he may feel how much more patent has been this lesson than all he has read in pages of abstract ratiocination."

ZOOLOGICAL NEWS.—In his presidential address before the British Association, Prof. Allman takes the ground that the deep-sea *Bathybius* may be an organism, as he thinks it not easy to believe that the very elaborate investigations of Huxley and Haeckel can be easily set aside. Huxley, at the close of the address, stated that his mind, at present, was in a state of suspense about it, though within a short time he had disowned it. Haeckel, himself, has, in recent papers, urged its recognition as an organism, while we may add that Dr. Bessels, in a letter to us, thinks that under the circumstances it is best to wait for more light as to the organic nature of the *Protobathybius* which he examined in the high Arctic regions.—The pamphlet of Prof. Moebius has made a strong impression on some minds previously in doubt, that *Eozoön* is of mineral rather than organic origin.—In the Proceedings of the Natural Science Association of Christiania, Norway, Prof. G. O. Sars gives excellent drawings of three whales, *Balenoptera rostrata*, *B. musculus* and *B. sibbaldii*. One can form some idea how these whales look from such admirable and evidently life-like sketches.—The Zoölogy of the Fiords near Bergen, Norway, by the Rev. A. M. Norman. (*Journal of Conchology*, II, 1879. Extracted, pp. 77.) This paper contains a list of 261 species of Mollusca collected at Bergen, Norway, by the author, and a supplemental list of ninety-two more which have been quoted from that region. No new species are described, but the notes on the synonymy of the species and their geographical distribution make the article both valuable and interesting.

ANTHROPOLOGY.¹

PREHISTORIC IMPLEMENTS OF THE RIVERS COYOTE AND GUADALOUPE, SANTA CLARA COUNTY, CAL.—Some three years ago my interest was awakened concerning prehistoric implements by finding what were, without doubt, stone and flint celts, though of rude workmanship.

Before this time there had been found in various places throughout the valley, while plowing fields and digging away river banks in bridge building, mortars in different stages of preservation.

¹ Edited by Prof. OTIS T. MASON, Columbian College, Washington, D. C.

Not much heed was paid to the occurrences, as they were accepted as the matter of fact details of a land whose commonplace things were accounted unusual and wonderful by people living in other States. A few winters ago, when the river Coyote endangered the city by an overflow, about forty acres were washed out on the west bank. About two miles below this washout were found two curious mortars or bowls, one fitting into the other. Farther search brought to light small implements plainly bearing marks of flaking tools. But as foreign countries seemed most likely to contain all the evidences of prehistoric man, on account of their greater geological age, the idea that they were the implements of any but a recent and degraded race, was set aside. Soon, however, a perfect arrow-head was found, which threw a flood of light on future research, which was prosecuted with earnestness, resulting in the discovery of many and some of them beautiful implements of flint, jasper, chalcedony, agate, &c., as well as some made from granite, gneiss, &c.

These implements consist of knives, scrapers, arrows, drills, polishers, hammers, flak~~ers~~^{es}, saws, axes, war-clubs, sling-stones, sinkers, charms or amulets, &c. They were found scattered along the river-bed below the washed-out field. The supposition is, that this locality was either a favorite camping ground or place of burial.

The scarcity of tools of the better class would indicate that this was only used as a place of sojournment for stated periods of hunting and fishing, or that some noted persons were buried here with the necessary utensils for their welfare in the happy hunting grounds. The number of knives, hammers and coarser implements seems to show that the encampment was for the purpose of obtaining supplies to last through a season spent elsewhere; while the fineness of material and finish of some would indicate their being used in burial.

A few implements have been found in the Guadalupe river banks, in excavations made in widening the river. They are of ruder workmanship and material than those from the Coyote. In a gravel pit on the Lick Homestead were found knives, flint cores, flakers, some small pieces of chalcedony in symmetrical shape, probably ornaments. The appearance of the Guadalupe implements compared with those from the Coyote shows the work of a different tribe, with narrower grounds of operation and perhaps of more recent date. I have called them prehistoric because many of them are polished. They are also of the materials which ethnologists have found were used earlier than the obsidian implements of recent times.—*Jennie R. Bush.*

ANTHROPOLOGICAL NEWS.—From the *Nation* of August 21st, we learn of a new and comprehensive dictionary of the Maya language with Spanish definitions, by Judge Don Juan Pio Perez. The author was born, 1798, at Merida, a short distance from

Uxmal. A long sojourn in the interior of the peninsula enabled him to study the inland dialects. The words taken from these form an important part of the dictionary, and are quite new. The coast dialects, mostly of the northern part of Yucatan, form the groundwork of the compilation, and additions were made to it from several ancient manuscript lexicons. The illustrious author had just terminated the letter U when, in 1859, death put an end to his labors. Subsequently, in 1870, Don Carlos Peon prevailed upon Dr. C. H. Berendt to digest from the materials on hand the remaining four letters of the alphabet. The work is a good-sized quarto of 437 pages, with two prefaces, and bears the title, "Diccionario de la lengua Maya, por D. Juan Pio Perez" (Merida de Yucatan, 1866-1877). Its publication was superintended by Eligio Ancona, a friend of the deceased author, and Dr. Fabian Carillo Suaste has added a biographical notice of Perez in twenty pages. The number of vocables explained amounts to 22,000; their meanings are given in concise items, worded with great precision. Syntactic examples are not often added as illustrations of words, though terms of archæological import are provided with longer explanations. Maya possesses considerable facilities for word composition, and we often find words counting from five to seven syllables; this is partly due to the circumstance that this idiom is simultaneously a prefix and a suffix language, partly also to the frequent use of syllabic reduplication.

The International Anthropological Exhibition at Moscow, which opened there on the 15th of April last, is reported in the papers to have been a great success. It took place in an immense building which is used in winter for drilling troops. The exposition was divided into several sections, among which those of archæology, craniology and ethnography played the chief part. There was also a department in which was shown, partly by pictures and partly by objects, the different methods of rearing children, swaddling, cradling, etc. The section of craniology embraced from 1200 to 1500 crania from various provinces, among which the Russian skulls are naturally in the majority. The archæological was also especially interesting. The exposition was completed by a congress, held from the 16th to the 25th of April, in the Polytechnic Museum, the meeting place of the Society of the Friends of the Natural Sciences. A second session took place from the 8th to the 17th of August, at which delegates from the various European states were present.

The third number of the *Revue d'Anthropologie* for the current year opens with a paper of seventy pages, by Dr. Paul Broca, entitled, "Cerebral localization; Researches upon the olfactory centres." The sections of this exhaustive treatise are as follows: 1. The role of comparative anatomy in the study of cerebral localization. 2. The olfactory apparatus of the mammals. 3. The olfactory centres among anosmatics. 4. Remarks upon the

respective functions of the different olfactory centers. 5. Conclusions relative to the olfactory centers of man. Of this last-named section we give a translation in full: "It is man who forms the objective point of our study; the facts of comparative anatomy which we have just set forth would not have deserved so much discussion if they did not converge toward this point. It will not, therefore, be profitless to review, in conclusion, the notions which comparative anatomy permits us to add to the anatomy and the physiology of the brain of man.

1. The external olfactory root (*racine*) traverses the Sylvian fissure and extends to the upper part of the hippocampus. It really originates in the cortex of this lobe.

2. The internal olfactory root proceeds to the intersection of the hemisphere and loses itself in the origin of the convolution of the corpus callosum.

3. The superior olfactory root, known as the *racine grise*, derives this name from the thin layer of gray substance which is spread over its inferior face, and which is continuous with the gray layer of the perforated space, but it is made up, like the two other roots, of white fibres, which, after an extremely short passage (*trajet*), returns to the posterior edge of the two first orbital convolutions.

4. There exists in the mantle of the hemisphere three distinct olfactory centers, corresponding to the three olfactory roots.

5. The anterior olfactory center embraces the posterior portion of the two first orbital convolutions. It commences posteriorly upon the anterior edge of the perforated space, and extends, from rear to front, over the second orbital convolution to the level of the fissure in the hippocampus. Upon the first orbital convolution its anterior limit is not indicated anatomically; but it is probable that it corresponds to the same horizon. From the mean position of the fissure in hippocampus, or of the depression which represents it, we may say that the orbital olfactory center comprises, on an average, the posterior third of the two first orbital convolutions.

6. The posterior olfactory center occupies the lobe of the hippocampus, which forms about the anterior third of the convolution of the hippocampus: a transverse line carried through the extremity of the hook of the hippocampus indicates sufficiently well the limit of this olfactory center.

7. The superior olfactory center is situated upon the internal face of the hemisphere. It embraces the intersection (*carrefour*) of the hemisphere and the first portion of the lobe of the corpus callosum (or convolution of the corpus callosum) from its origin at the intersection to the level of the frontolimbic *pli de passage*, or of the frontolimbic fissure, which indicates, in front of the *genou corporis callosi*, the position of this *pli de passage* when it is profound."

It is impossible to give any conception of the vast amount of research in this valuable essay in a short review, and, therefore, our readers are referred to the paper itself.

In the same number of the *Revue* will be found a report upon the Ethnographic chart of France, by Dr. Gustav Lagneau, and a criticism of several works upon circumcision as practiced in various parts of the world, by M. Zaborowski.

GEOLGY AND PALÆONTOLOGY.

GEOLOGICAL NOTES.—At the Saratoga meeting of the American Association for the Advancement of Science Prof. J. P. Lesley, State Geologist of Pennsylvania, read a very long paper on the progress of the Second Geological Survey of Pennsylvania. The very valuable results accomplished by this survey, both for scientific and economic purposes, were fully set forth, and the importance of completing it was dwelt upon.

Prof. R. P. Whitfield gave notice of the occurrence of rocks in Central Ohio, representing the Marcellus shales of New York. A brief dissertation on the geology of Port Henry, New York, was presented by Prof. T. Sterry Hunt, of Montreal.

Prof. John W. Chickering, Jr., gave a description of the newly discovered cave at Luray, Page county, Va., which he said surpassed the Mammoth cave in beauty and in the size of some of its chambers, and was inferior only in total extent.

Miss Emily A. Smith, of Peoria, Ill., read a paper on the great Oberstein industry, showing the methods of cutting, coloring and polishing agates and secondary gems. She illustrated her remarks by a very fine collection of specimens, which were greatly admired. In the little German village of Oberstein and its vicinity are the 189 mills which cut and polish the countless agates before they are scattered to the four corners of the earth. She visited the locality last season. Through this region is a ledge of trap rock or metaphyx, which was formerly quarried for agates. These quarries are now deserted, and all the agates worked are imported yearly, principally from Brazil, and sold at public auction, the owners of the wheels buying each the amount he can work up during the year. Many of these mills date back to the middle ages. After the secret of coloring was discovered from the Romans, it was found that the Brazilian agates were much more porous, and consequently more readily received the coloring matter. The coloring is principally done at the houses of the workmen.

Prof. F. W. Clarke displayed a specimen of graphite from the Ducktown copper mine, and read a brief paper on it. J. W. Osborn, of Washington, read notes on a peculiar case of corrosion of tin; and Prof. C. H. Hitchcock gave an account of the Blue Hill, Maine, copper veins.—Bernhard Cotta, the geological writer, whose death was announced in September, was born